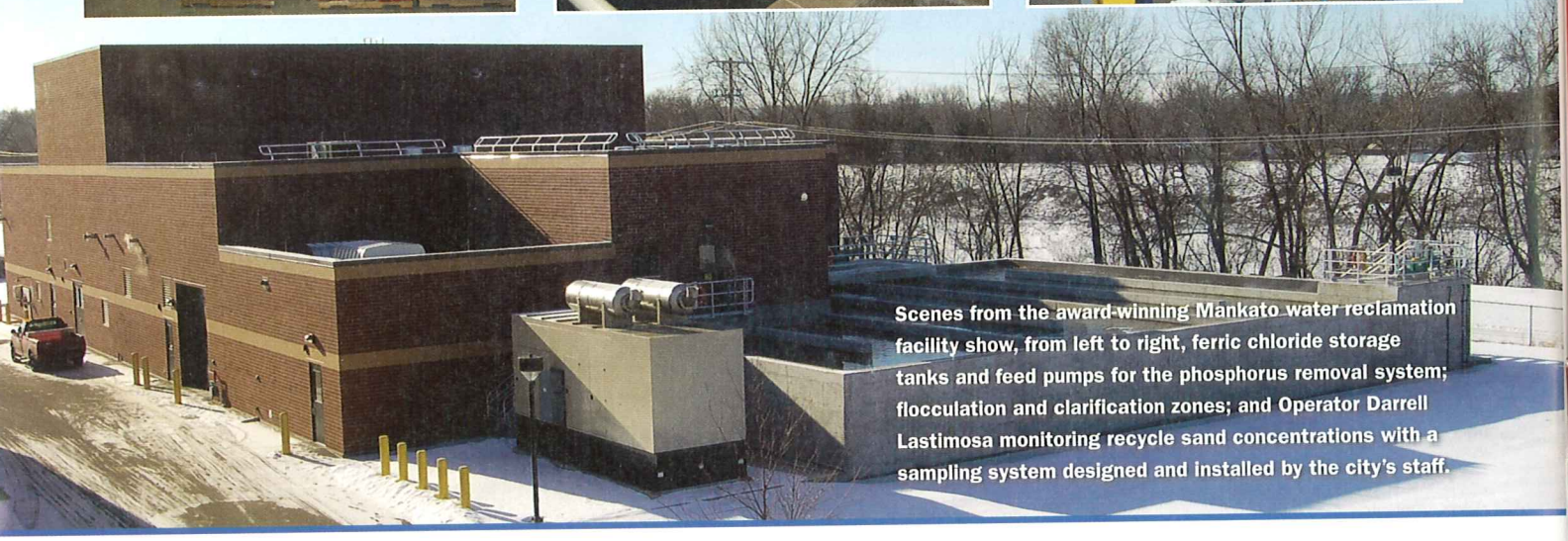
Finished Water

A PHOTOGRAPHIC PROFILE



Scenes from the award-winning Mankato water reclamation facility show, from left to right, ferric chloride storage tanks and feed pumps for the phosphorus removal system; flocculation and clarification zones; and Operator Darrell Lastimosa monitoring recycle sand concentrations with a sampling system designed and installed by the city's staff.

WATER RECLAMATION FACILITY CUTS DEMAND, BOOSTS QUALITY

The American Public Works Association recently recognized the Mankato, Minn., water reclamation facility for its innovative, environmentally responsible, and economical production of high-quality water for reuse to generate electricity. The facility is one of the first of its kind in the United States.

Calpine Corp., a US power company, paid for design and construction of the city-owned and -operated facility, located at the city's wastewater treatment plant (WWTP). The facility treats the WWTP's effluent water to meet water reuse criteria and conveys it by pipeline to the new Calpine-owned Mankato Energy Center to cool the center's natural gas-fired turbine, reducing local surface and groundwater demand and improving the quality of reused water that's eventually returned to the environment.

An estimated 679 mil gal of water will be saved annually through reuse. The city, spared having to build a phosphorus-removal facility to comply with new phosphorus limits, saved approximately $10 million. Calpine's savings include the operational and maintenance costs of the reclamation facility, anticipated to be about $500,000/yr over the 20-yr agreement. Calpine's potable water cost savings will exceed $1.5 million annually.

The WWTP serves Mankato and five other cities and districts. New Minnesota water quality requirements limit cities on the Minnesota River to 1 mg/L total phosphorus by 2015 to prevent algal blooms and pollution problems. Since the facility began operation in 2006, biochemical oxygen demand has dropped from 1.6 mg/L to undetectable levels, and total phosphorus levels have dropped to 0.35 mg/L.

PROJECT SPECIFICS

Project Name: Mankato Water Reclamation Facility

Owner and Operator: City of Mankato, Minn.

Designer: Black & Veatch

Completion Date: Summer 2006

Water Source: Mankato Wastewater Treatment Plant

Technology: The dual-purpose facility provides two-stage tertiary treatment for the city's treated wastewater effluent. The first stage provides phosphorus removal for all of the WWTP's current and future needs; the second stage provides additional filtration and chlorination to meet reuse requirements established by the Minnesota Pollution Control Agency.

Project Cost: Approximately $20 million

Capacity: 18 mgd

Employees: 13

PHOTOGRAPHS: CITY OF MANKATO